



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/582,525

01/19/2007

Jaakko Pere

Q95394

1046

23373 7590 07/09/2010
SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

CALANDRA, ANTHONY J

ART UNIT

PAPER NUMBER

1791

NOTIFICATION DATE

DELIVERY MODE

07/09/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sughrue@sughrue.com
PPROCESSING@SUGHRUE.COM
USPTO@SUGHRUE.COM

Office Action Summary	Application No. 10/582,525	Applicant(s) PERE ET AL.	
	Examiner ANTHONY J. CALANDRA	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5 April 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1791

Detailed Office Action

The communication dated 4/5/2010 has been entered and fully considered.

Claim 2 has been canceled. Claims 19-25 are new. Claims 1, 3-18 have been amended.

Claims 1 and 3-25 are pending.

Information Disclosure Statement

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, applications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) subsection I. states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Response to Arguments

Objections

The applicant has overcome the specification objection

112 1st and 101 rejections

The applicant has overcome the 112 1st and 101 rejections of claim 16.

112 2nd rejections

The applicant has overcome the 112 2nd rejections.

Art Rejections

The examiner has withdrawn the rejections based on EACHUS, alone.

Art Unit: 1791

EACHUS in view of PEREZ and BRODA

Applicant argues that EACHUS teaches a vast amount of agents to arrive at Phanerochaete.

The examiner disagrees. EACHUS does not require the person of ordinary skill in the art to select *Phanerochaete* from 'a vast number of unrelated biological agents'. To the direct contrary EACHUS states that the fungi is selected from one of three groups see e.g. claim 9 of EACHUS. The selection of *Phanerochaete* from 1 of three groups cannot be considered by any reasonable finder of fact a choice from a *vast number*.

Applicant argues that while EACHUS discloses cellulose it fails to expressly disclose cellobiohydrolase or endoglucanase.

While EACHUS does not explicitly disclose cellobiohydrolase or endoglucanase, it discloses *Phanerochaete* which inherently produces those two enzymes. EACHUS disclose that the cultured product is applied to the wood chips. As *Phanerochaete* of EACHUS produces cellobiohydrolase or endoglucanase the culture applied to the wood chips will comprise these enzymes.

In any case the examiner suggests the substitution of *Trichoderma* white rot fungi for that of the *Phanerochaete* of EACHUS, in view of PEREZ and BRODA; as such this argument is moot.

The applicant argues that PEREZ teaches away from the Trichoderma white rot fungi by stating several thermophilic white rot fungi can degrade cellulose faster than 'T reesi'.

This is not a teaching away but merely suggesting other embodiments. PEREZ also states that *T reesi* is mesophilic while the sentence that the applicant has pointed out described thermophilic bacteria. A person of ordinary skill in the art would clearly prefer mesophilic

Art Unit: 1791

(moderate temperature) fungi in comparison to thermophilic (high temperature) fungi when not wanting to pay for the expense of heating up the system to hotter temperatures. To grow thermophilic fungi requires more heat energy, which would be a reason to choose mesophilic fungi.

Further, the disclosure of BRODA must be considered in which the disclosure suggests that *T. reesi* is an optimum fungi [pg. 98 column 2 paragraph 1]. BRODA suggests that *T. reesi* can degrade cellulose and discloses its specific concentrations of the product.

Applicant argues that there are unexpected results in which the example show high amounts of enzymes compared to the present invention.

The examiner notes that the independent claims do not claim an amount of enzyme to be applied. For an argument towards unexpected results to be valid there must be a nexus between the claim elements and that of the arguments.

Further, these are only two examples. The applicant must compare the invention to the closest prior art. In this case EACHUS discloses using enzymes from *Phanerochaete*. However, the applicant has not shown the results are unexpected as compared to *Phanerochaete*. Further, EACHUS gives a clear teaching of only using an amount that is sufficient [claim 18].

Additionally, BRODA suggests that the enzymes work in synergy and therefore a synergistic effect is not an unexpected result [see e.g. BRODA pg. 222 paragraph 1].

Art Unit: 1791

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 1-10 and 12-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 97/40194 EACHUS et al., hereinafter EACHUS, in view of *Biodegradation and biological treatments of cellulose, hemicellulose and lignin: an overview* by PEREZ et al., hereinafter PEREZ and *Biotechnology in degradation and utilization of lignocellulose* by BRODA, hereinafter BRODA.

As for claims 1, 3-6, 17, and 19-21, EACHUS discloses chipping a raw wood material [pg. 3 lines 5-10], compressing the chips in a liquid phase contact with an enzyme preparation [pg. 6 lines 15-20], which can disintegrate structural parts of the wood [pg. 10 lines 13-15]. EACHUS then discloses refining the wood [pg. 15 lines 1-5].

Art Unit: 1791

EACHUS discloses that *Phanerochaete* is one of the bacteria used [claim 9] and that the biological treatment agent comprises the culture product enzymes produced therefrom [claim 7], including cellulases. The applicant claims that *Phanerochaete* is a bacterium that produces both cellobiohydrolase and endoglucanase [Instant claim 6]. Therefore the enzymatic culture of EACHUS shall treat the wood chips with both claimed enzymes. EACHUS fails to disclose the percentage of cellobiohydrolase and endoglucanase in the culture product of *Phanerochaete*. EACHUS additionally teaches white rot fungi for wood [pg. 10 lines 5-10]. PEREZ discloses that both *Phanerochaete* and *Trichoderma reesi* are both white rot fungi [pg. 56 column 2]. At the time of the invention it would have been obvious to substitute one white rot fungus for another white rot fungus intended for the same purpose of biopulping. The person of ordinary skill in the art would be additionally motivated to do white rot treatments as per EACHUS using *Trichoderma reesi* because it is one of the most studied white rot fungi.

In addition to the above and as for claims 3, 4, 17, and 19-21 BRODA teaches that *Trichoderma reesi* produces 20-35% endoglucanases and 65-80% cellobiohydrolases or a ratio of 4:1 (80% cellobiohydrolase 20% endoglucanases) and 1.85:1 (65% cellobiohydrolase 35% endoglucanases) and which falls within the instant claimed range. At the time of the invention it would have been obvious to use the cellulose extract of BRODA for the treatment of EACHUS and PEREZ to produce endoglucanases and cellobiohydrolases in the claimed amounts. The person of ordinary skill in the art would be motivated to do so because these amounts of enzymes are produced when *Trichoderma reesi* is given optimum growing conditions.

As for claims 7 and 22 , EACHUS teaches the features as per above and discloses a one enzyme treatment with 5 grams (5000 mg) of enzyme and 100 (45,359 grams) pounds of chips

Art Unit: 1791

[pg. 12 lines 20-25, pg. 13 line 6] which is 0.11 mg protein per gram of chips which falls within the instant claimed range. EACHUS additionally teaches 55 grams (55,000 mg) of enzyme [example 4 lines 20-25] which is 1.21 grams. While EACHUS does not teach the amount of enzymes from *Phanerochaete* or *Trichoderma reesi* that should be used it would be obvious to the person of ordinary skill in the art to optimize through routine experimentation the amount of enzymes used on wood chips to obtain a sufficient amount [pg. 7 lines 28-30] to obtain the desired amount of refining energy decrease. The person of ordinary skill in the art would expect higher enzyme amounts to allow for greater amounts of degradation. The amount/concentration of enzyme on wood chips is a clear result effective variable [see e.g. MPEP 2144.05 (II) (B) Optimization of ranges and result effective variables].

As for claims 8 and 23, EACHUS teaches a refiner range of 100-200 ml freeness [pg. 12 line 13].

As for claims 9 and 10, EACHUS discloses a compression ratio of 4:1 which falls within the instant claimed ranges [pg. 13 line 4].

As for claim 12, EACHUS discloses a screw press [pg. 6 lines 25-32]

As for claim 13, EACHUS discloses the treatment time of 48 hrs which falls within the instant claimed range [pg. 13 line 9].

As for claim 14, EACHUS discloses chip steaming [pg. 8 lines 20-25].

As for claim 15, EACHUS discloses a two stage refining process without any additional chemicals or thermal treatment which is a RMP treatment, refiner mechanical pulp.

As for claim 16, EACHUS discloses that the pulp is primarily for papermaking [pg. 5 lines 3-5].

Art Unit: 1791

As for claims 18 and 25, EACHUS teaches the abutting freeness of 100 ml but not less than 100 or less than 80. The examiner takes Official notice that freeness decreases as pulp is further refined. Further, it would be obvious to the person of ordinary skill in the art to increase the refining amount. The applicant failed to argue the taking of official notice in the arguments dated 4/5/2010 in response to the notice dated 12/3/09. The person of ordinary skill in the art would be motivated to increase refining (and therefore lower freeness) to increase fiber development and hence fiber strength.

As for claim 24, EACHUS disclose the range of 60 seconds to 14 days which overlaps with the instant claimed range [claim 13].

2. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 97/40194 EACHUS et al., hereinafter EACHUS, *Biodegradation and biological treatments of cellulose, hemicellulose and lignin: an overview* by PEREZ et al., hereinafter PEREZ and *Biotechnology in degradation and utilization of lignocellulose* by BRODA, hereinafter BRODA, as applied to claim 1 above, and in view of *Process Variables and Optimization* by LEASK, hereinafter LEASK.

As for claim 11, EACHUS teaches the features as per above but fails to teach the chip size. LEASK discloses that for mechanical pulping the chip size should range from 7 mm to 22 mm [pg. 134 column 1]. At the time of the invention it would have been obvious to use the chip size of LEASK in the mechanical pulping process of EACHUS. The person of ordinary skill in the art would be motivated to do so to obtain superior pulp quality in terms of both bonding and fiber quality [pg. 134 column 1].

Art Unit: 1791

Conclusion

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is (571) 270-5124. The examiner can normally be reached on Monday through Thursday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1791

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anthony J Calandra/
Examiner, Art Unit 1791

/Eric Hug/
Primary Examiner, Art Unit 1791